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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/500,214	03/17/2005	Takuya Sugawara	010986.55104US	2535
23911	7590	02/03/2006	EXAMINER	
CROWELL & MORING LLP INTELLECTUAL PROPERTY GROUP P.O. BOX 14300 WASHINGTON, DC 20044-4300			ESTRADA, MICHELLE	
			ART UNIT	PAPER NUMBER
			2823	

DATE MAILED: 02/03/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

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<b>Office Action Summary</b>	Application No. 10/500,214	Applicant(s) SUGAWARA ET AL.	
	Examiner Michelle Estrada	Art Unit 2823	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 22 November 2005.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 22 November 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |   |   |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>11/22/05</u> . | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Information Disclosure Statement***

The information disclosure statement filed 11/22/05 fails to comply with 37 CFR 1.98(a)(2), which requires a legible copy of each cited foreign patent document; each non-patent literature publication or that portion which caused it to be listed; and all other information or that portion which caused it to be listed. It has been placed in the application file, but the information referred to therein has not been considered. A copy of AH reference, "Cu Damascene Formation Process", Atsuhiro Tsukune et al. is missing.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

Claims 1-9 are rejected under 35 U.S.C. 102(a) as being anticipated by Applicant's Admitted Prior Art (AAPA).

Re claim 1, AAPA discloses a method that applies a hydrogen sintering process to an electronic device substrate on which a semiconductor device is already formed, the substrate processing method comprising the steps of: forming an atmosphere comprising hydrogen radicals and hydrogen ions by exciting a processing gas including a noble gas and hydrogen into a plasma (page 5, lines 27-33), and applying the

hydrogen sintering process to the electronic device substrate by exposing the electronic device substrate to the hydrogen radicals and the hydrogen ions.

Re claim 2, AAPA discloses wherein the atmosphere including hydrogen radicals and hydrogen ions is selected from the group consisting of hydrogen gas, heavy hydrogen gas, and mixtures thereof.

Re claim 3, AAPA discloses wherein the plasma is formed by microwaves (page 5, lines 32-33).

Re claim 4, AAPA discloses wherein the plasma is formed by emitting microwaves from a planar antenna (slot antenna) (page 5, lines 32-33).

Re claim 5, AAPA discloses wherein the semiconductor device includes a MOSFET and a DRAM (page 1, lines 20-25).

Re claim 6, AAPA discloses wherein the substrate for the electronic device is a SiGe substrate (page 2, lines 7-10).

Re claim 7, AAPA discloses wherein the MOSFET includes a thermal oxide film as a gate insulation film (page 2, lines 14-23).

Re claim 8, AAPA discloses wherein a gate insulation film of the MOSFET includes a gate insulation film formed by CVD (page 2, lines 14-23).

Re claim 9, AAPA discloses wherein the semiconductor device includes a storage element using a high dielectric insulation film as an interelectrode insulation film (page 1, line 32-page2, line 2).

Re claim 11, AAPA discloses forming a gate insulation film (22A) on said substrate (21C); forming an electrode of polysilicon (23A) on said gate insulation film;

and exposing said polysilicon electrode to an atmosphere containing hydrogen radicals and hydrogen ions, said hydrogen radicals and said hydrogen ions being formed by exciting a gas containing a noble gas and a hydrogen gas by plasma.

Re claim 12, AAPA discloses wherein the atmosphere including hydrogen radicals and hydrogen ions is selected from the group consisting of hydrogen gas, heavy hydrogen gas, and mixtures thereof.

Re claim 13, AAPA discloses wherein the plasma is formed by microwaves (page 5, lines 32-33).

Re claim 14, AAPA discloses wherein the plasma is formed by emitting microwaves from a planar antenna (slot antenna) (page 5, lines 32-33).

Re claim 15, AAPA discloses wherein the semiconductor device includes a MOSFET and a DRAM (page 1, lines 20-25).

Re claim 16, AAPA discloses wherein the substrate for the electronic device is a SiGe substrate (page 2, lines 7-10).

Re claim 17, AAPA discloses wherein the MOSFET includes a thermal oxide film as a gate insulation film (page 2, lines 14-23).

Re claim 18, AAPA discloses wherein a gate insulation film of the MOSFET includes a gate insulation film formed by CVD (page 2, lines 14-23).

Re claim 19, AAPA discloses wherein the semiconductor device includes a storage element using a high dielectric insulation film as an interelectrode insulation film (page 1, line 32-page2, line 2).

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 10 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over AAPA as applied to claims 1-9 and 11-19 above, and further in view of the following comments.

AAPA does not disclose wherein the hydrogen radicals and the hydrogen ions are formed at a pressure of 13.3 to 267 Pa.

One of ordinary skill in the art would have been led to the recited pressure through routine experimentation to achieve a desired rate of the sintering process. In addition, the selection of pressure, it's obvious because it is a matter of determining optimum process conditions by routine experimentation with a limited number of species of result effective variables. These claims are prima facie obvious without showing that the claimed ranges achieve unexpected results relative to the prior art range. In re Woodruff, 16 USPQ2d 1935, 1937 (Fed. Cir. 1990). See also In re Huang, 40 USPQ2d 1685, 1688 (Fed. Cir. 1996)(claimed ranges or a result effective variable, which do not overlap the prior art ranges, are unpatentable unless they produce a new and unexpected result which is different in kind and not merely in degree from the results of the prior art). See also In re Boesch, 205 USPQ 215 (CCPA) (discovery of optimum value of result effective variable in known process is ordinarily within skill or art) and In

re Aller, 105 USPQ 233 (CCPA 1995) (selection of optimum ranges within prior art general conditions is obvious).

Note that the specification contains no disclosure of either the critical nature of the claimed pressure or any unexpected results arising therefrom. Where patentability is said to be based upon particular chosen pressure or upon another variable recited in a claim, the Applicant must show that the chosen pressure is critical. In re Woodruf, 919 F.2d 1575, 1578, 16 USPQ2d 1934, 1936 (Fed. Cir. 1990).

### ***Response to Arguments***

Applicant argues that pages 4-5 of the specification merely recites background information related to the nature of the problem solved, and that page 5, lines 27-33 do not refer to a hydrogen sintering process. Furthermore, Applicant re-inserted page 4, line 1-page 13, line 5 under the heading "Best Mode for Carrying Out the Invention".

The Examiner finds that Applicant's position to be puzzling. For examination purposes, it is customary for all art disclosed in the background section of an application to be considered admitted prior art regardless of the terminology used by the Applicant. If some of the disclosed art is not prior art under 35 USC §102 then it is incumbent on the Applicant to clearly distinguish that which is prior art from which is not. Further, 37 CFR 1.56 clearly states that each individual associated with the filing and prosecution of a patent application has a duty of candor and good faith in dealing with the Office, which includes a duty to disclose to the Office all information known to that individual to be material to patentability. Because Applicant has not clearly established which of the

"background art" is not prior art, all of the art in the background section will continued to be presumed admitted prior art.

In canceled page 7, lines 7-13, describes Figs. 1A-1H as a "typical application" and this paragraph was moved to "Best Mode for Carrying Out the Invention", but this figures are labeled as "Prior Art". Furthermore, in the "Brief Description of the Drawings" on page 15, Figs. 1A-1H are described as diagrams showing a "previously proposed fabrication process" of a semiconductor device and Applicant agreed to labeled them as "Prior Art", but instead change their description under "Best Mode for Carrying Out the Invention".

### ***Conclusion***

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of



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the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michelle Estrada whose telephone number is 571-272-1858. The examiner can normally be reached on Monday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew Smith can be reached on 571-272-1907. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 571-272-2800.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
Michelle Estrada  
Primary Examiner  
Art Unit 2823

ME  
January 25, 2006



SUBSTITUTE DRAWING  
Attorney Docket No. 010986.55104US  
Application Serial No. 10/500,214

FIG. 1A PRIOR ART

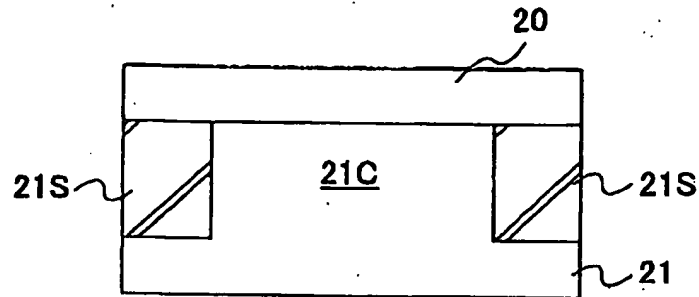


FIG. 1B PRIOR ART

RCA CLEANING

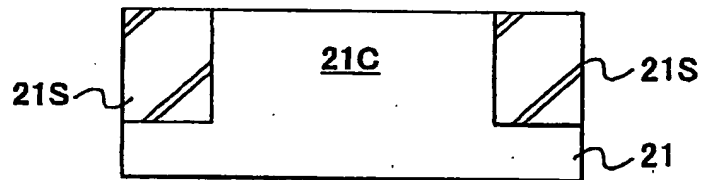
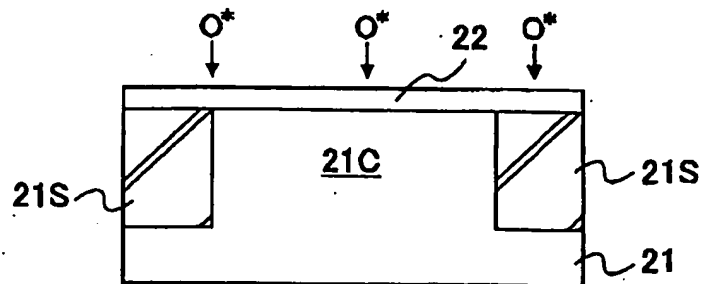


FIG. 1C PRIOR ART



Approved  
ME  
1/24/06

FIG. 1D PRIOR ART

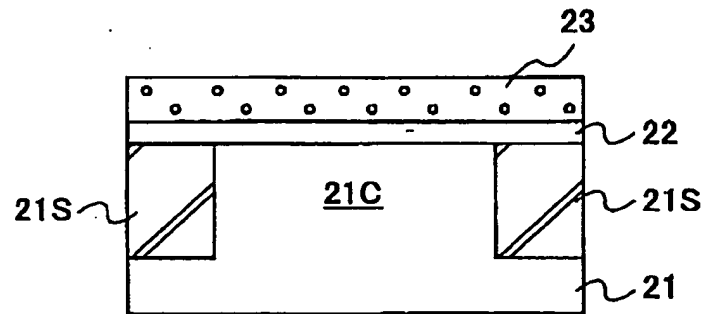


FIG. 1E PRIOR ART

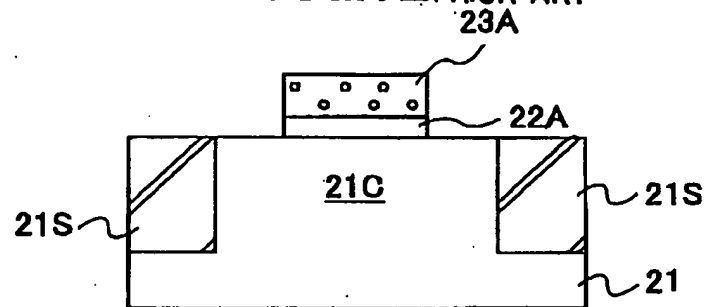


FIG. 1F PRIOR ART

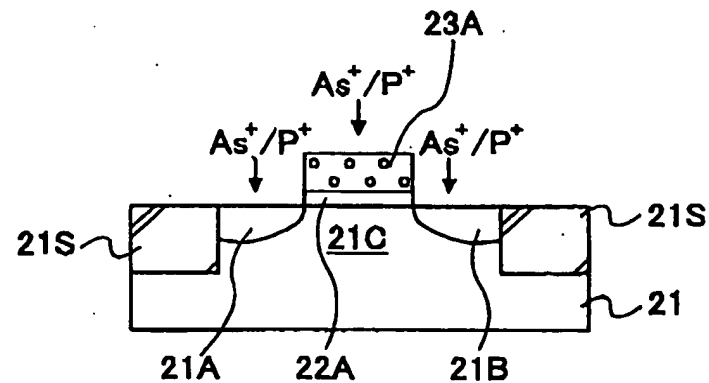


FIG.1 G PRIOR ART

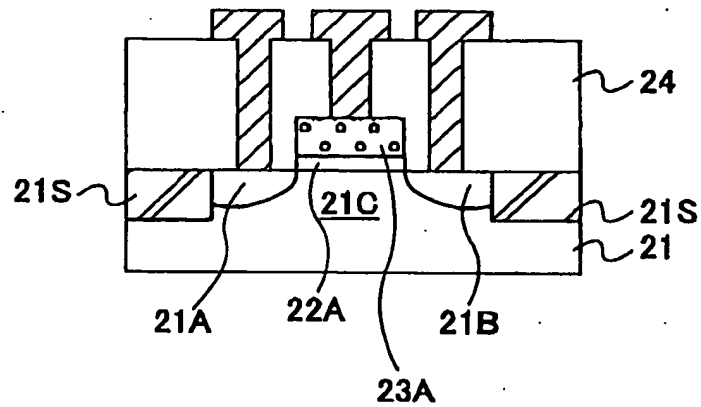


FIG.1 H PRIOR ART

